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THE AFRICANIZED HONEY BEE

CHARACTERISTICS

The Africanized honey bee is the result of matings between one of several subspecies of the Western Honey Bee from Africa (Apis mellifera adansonii) and the European-type domestic bees of Brazil. These hybrids and their offspring have spread over most of Brazil and adjacent South American countries since the original African bees were introduced and accidentally released.

These aggressive new strains, which closely resemble U.S. domestic honey bees, produce more honey in the tropics than the original European strains, pollinate crops as effectively, and thrive in tropical and semitropical climates. The spread of these hybrids has caused problems over the years, as they established their aggressive traits throughout the bee population of most of tropical South America.

The Africanized bees are descendants of 26 colonies of honey bees headed by queens from Africa. In 1956, they were brought to Brazil by a geneticist who wished to interbreed them with European bees to produce a new type particularly suited to the South American tropics. The Africanized honey bees swarmed from experimental colonies near Sao Paulo, Brazil and interbred naturally in the wild with the European-type honey bees of the region. The resulting hybrids have since spread widely in tropical and sub-tropical South America.

These hybrids swarm long distances, are highly sensitive to disturbance, and protect their hives with great aggressiveness and persistence. They have been falsely termed "killer bees" because they are more prone to sting than the average honey bee in the United States.

The sting of an Africanized bee is no more venomous than that of our domestic bees and there is no evidence that these bees cause more human fatalities in South America or Africa than any other kind of bee in North America or Europe. They are aggressive and chase would-be targets further, but they are not more deadly than any other type of bee. Like all honey bees, they lose their stingers when they sting, then die. There are people who are highly allergic to bee venom; however, most people can absorb several initial stings with only itchy, uncomfortable swellings resulting.

Africanized honey bees swarm excessively. Swarming is a form of colony proliferation. The queen bee leaves with about half the bees in the colony to find a new home. The bees remaining in the hive choose a new queen. Thus, by swarming, the original colony divides itself in two. Africanized bees swarm much more often than domestic bees and for longer distances.

Absconding takes place when bees leave the colony completely to move to a new location. European type bees rarely do this. Africanized bees abscond on flights as long as fifty miles, a trait that has contributed to an average movement rate of 200 miles per year. This has taken them as far northward as Venezuela, westward into Peru and Bolivia, and southward into Uruguay and Argentina. Absconding was necessary for survival in Africa when areas were struck by dry spells and bees were forced to move to find food.

American beekeepers do not want this "absconding" trait bred into our domestic lines of bees. A tendency to readily abscond during shortages of nectar or pollen, or when being transported by truck, would be highly disruptive to our beekeeping system and disturb the vital pollination of U.S. crops.

MIGRATION FACTORS

Researchers, supported by the Science and Education Administration (SEA), have closely detailed the movement, spread, and habits of Africanized honey bees in South America at a research station in French Guiana. Here, under a cooperative agreement with the University of Kansas, they conducted a two-year study that collected valuable data on brood cycles, swarming and absconding patterns, migration distances, and such behavioral aspects of the Africanized honey bee as mating and stinging habits.

To accomplish this, the investigators in Guiana developed an 80-colony apiary of highly Africanized bees. Work with these colonies allowed them to develop a comprehensive understanding of the hybrids behavior and the management techniques to handle them.

The study site in French Guiana is being moved to Venezuela where a bee breeding laboratory will be established. The northern and western front of the Africanized honey bee migration will be monitored from this location.

Research that will be conducted in Venezuela by SEA-supported scientists from the University of Kansas will focus on the migration distances and swarming and absconding traits of the hybrid bee. Other studies will cover the mating and stinging behavioral aspects. Venezuelan apiculturists have already been trained in the bee handling and management practices that have been developed through SEA research.

Investigators who have studied the migratory habits of the Africanized bees have noted that these bees act less aggressively and spread more slowly in the temperate climates of South America. Bees that moved southward from Sao Paulo to latitudes comparable to those of the lower United States have become somewhat milder in nature and easier to handle. Only bees that spread northward into tropical areas have maintained the aggressive characteristics

that make the bees undesirable.

POTENTIAL FOR SPREAD

What are the possibilities of the Africanized honey bees reaching the borders of the Southern United States?

Not many scientists believe that the vast deserts of Mexico will serve as a barrier to the hybrids' northern migration as the wastelands of the Sahara Desert have blocked their progress in Africa. There are north-south corridors of favorable environment that could enable them to skirt the deserts. An inhibiting factor is the inability of the hybrid to endure winters longer than several months. However, the possibility exists that at the present migration rate in an estimated 11 to 15 years the Africanized honey bees could spread naturally through Central America and Mexico and reach northern Mexico.

Strict quarantine regulations are being enforced by the Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture to prevent Africanized bees from arriving in this country ahead of their natural migration. Present legislation prohibits the importation of honey bees into the United States from most countries. Canada, where similar legislation is in effect, allows some importation by special permit for research purposes only. APHIS port inspectors check incoming aircraft, ships, and vehicles to prevent Africanized bees from accidentally or illegally entering this country.

MANAGEMENT PRACTICES

Africanized honey bees can--and are--being safely managed by beekeepers knowledgeable of special handling practices. Because of the aggressive characteristics of the hybrid, some beekeepers must work populous colonies wearing coveralls and gloves in addition to the usual veil protection. This is uncomfortable attire in a tropical climate. Others, researchers and commercial beekeepers in South America accustomed to the habits of the hybrids and recognizing when it is safe to do so, often forego the extra protective clothing without adverse effects. Knowledge in handling the hybrid has proven worthwhile: Africanized bees can produce up to 50 percent more honey under tropical conditions than European bees and are as effective in crop pollination.

In various sections of Brazil, where domestic colonies of bees have been effectively maintained by expert beekeepers, constant culling of the worst colonies and replacement with gentle strains has taken place. As a result, in central and southern Brazil, stinging by honey bees is rarely a problem any longer.

GENETIC AND BEHAVIORAL STUDIES

To maintain the desirable characteristics and quality of American bee stocks, and protect them from unwanted genetic changes, SEA researchers in this

country are refining artificial insemination techniques used on queen bees and encouraging further use of these techniques by domestic bee breeders.

The technique of using artificial insemination of queen bees to control mating of honey bees was originally only a research tool. However, in 1977 it was adapted for commercial queen production, and it is expected that in the next decade this technique will see widespread usage. This work has been a major concern of SEA researchers at the bee breeding laboratory at Baton Rouge, La. Whenever Africanized honey bees become a problem, controlled mating through artificial insemination will be one of the most important tools available in supplying and maintaining desirable honey bees.